The Basic Roamer Company

RoamerTime+

User Manual

It's a Navigator's Thing

This version of the RoamerTime+ User Manual is for RoamerTime+ software version 1.52.x

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Welcome

RoamerTime+ is an advanced unit for road, regularity and stage rally navigators/co-drivers with the following major features:

- seven easy to use modes, each one specifically designed to simplify the different navigator/co-driver tasks related to time of day, distance travelled, speed and time taken during different parts of different types of rallies
- a unique facility where you can control the features that are available in your unit by licencing only the modes that you want to use. For example, if you have only used the unit for road rallies and then decide to tackle a stage event, you can simply purchase the "Stage mode" licence to give you an auto-starting stopwatch and stage distance measurements
- operation via internal battery or vehicle supply power, with all information being retained, including time of day and running stopwatches, when the unit is powered off
- adjustable display brightness, simple distance calibration (over any distance and with 100 to 99,999 distance sensor pulses per mile/km, avoiding the need for external pulse doublers or dividers), on-event adjustment of measured distances, and the ability to easily set the time of day to any second
- a demonstration mode, where the unit can simulate travelling at a constant speed allowing practice use without being in a vehicle
- a number of user selectable options on how the unit and the displays operate, for example the number of decimal places shown for distances
- a remote control unit that allows operation of the most common functions without touching the unit
- an external splitter box that simplifies installation in a vehicle with support for all common distance sensors including electronic speedometers
- a quick release mechanism to an easily mounted bracket allowing adjustable fitting in all types of vehicles.

This user manual describes the ***RoamerTime+*** features and how to use them and covers:

- ***RoamerTime+*** modes
- General Description
- Getting Started
- Options
- Mode Descriptions
- Display Visibilities
- Display Brightness
- Time of Day
- Calibration
- Distance Adjustment
- The Remote Unit
- Demonstration Mode
- Connections
- Mode Licencing

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RoamerTime+ Modes

The seven ***RoamerTime+*** modes, their features and usage are:

- Basic Mode - a dedicated display containing time of day plus two stopwatches - for general timing of road, regularity or stage rally sections - plus the time of day and the stopwatch elements of the Road, Rally, Regularity and Stage modes
- Road Mode - time of day plus total and trip distances - for general road distance timing including navigating between competitive sections using event road books
- Speed Mode – current speed, time of day plus trip distance - for general road use and for when travelling through neutral/non-competitive sections
- Rally Mode - time of day plus stopwatch and distance - for selective sections on road rallies
- Regularity Mode - stopwatch plus total and trip distances - for complex regularity sections where speed changes are needed at total or intermediate distances and/or time allowances are given for crossing other roads/railway lines etc
- Stage Mode - time of day plus 1/10th second stopwatch and stage distance - for special stage timing with simple one-button auto-start and freeze of stage times
- Totals Mode - time of day plus distance travelled and total time taken - for checking or recording the total distance travelled, plus the total amount of time that the vehicle has been moving.

Basic Mode is available on all ***RoamerTime+*** units and a distance sensor is not required. Full operation of the other modes requires a distance sensor and the unit to contain a licence for that mode. Mode licences can be purchased individually and you can choose what licences you want the unit to have at the time of purchase or they can be obtained from ***www.thebasicroamer.co.uk*** after purchase. You can easily apply mode licences yourself (see *Mode Licencing*).

General Description

RoamerTime+ has a robust metal case with a front panel comprising an on/off toggle switch, three lines of 7 segment LED displays and 4 multi-function buttons.

The left hand end panel has an 8-way socket for connecting a remote unit or a splitter box, the latter allowing power, distance sensor and remote unit connections. The right hand end panel has a DC power socket for external power when a remote unit is plugged into the 8-way socket, or the 8-way socket is not used. The rear panel contains the 6x AA battery compartment.

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Each end panel also contains a M6 captive threaded nut for clamping the unit to its mounting bracket via the supplied thumbscrews and rubber washers.

Getting Started

Mounting the Unit

The unit is provided with a mounting bracket. It is strongly recommended that this is used and it can be mounted on any suitable vertical, horizontal or sloping surface. The unit can then be mounted on the bracket and tilted to the best viewing angle.

The inside distance between the arms of the bracket should be set to 138mm. When mounting the unit in the bracket, the rubber washers should be between the unit and the inside of the bracket arms.

The unit can be removed from the bracket by just loosening the thumbscrews and sliding the unit out of the slots - the thumbscrews do not need to be removed completely. ***NOTE:*** Fixing bolts longer than the supplied thumbscrews ***must not*** be used.

Battery Power

The unit can be powered from 6x AA batteries fitted in the rear battery compartment. Alkaline or rechargeable batteries may be used and 1800maH or better batteries are recommended. With a fresh set of 1800maH batteries the unit will operate for more than 12 hours with all displays visible at their minimum brightness – the unit can therefore be used for a night road rally on just internal battery power, avoiding the need for any external power to be obtained from the vehicle.

If only batteries are fitted, the unit quickly flashes the entire display off once every 5 seconds when the battery voltage is low. If the battery voltage falls further, the display will go to minimum brightness to try to keep the unit running as long as possible - *however the batteries should be changed as soon as possible*.

If batteries are fitted and external power is also present:

- the external power source is used to power the unit – the batteries are not used and will not go flat.
- the batteries will power the unit if there are any interruptions to the external power. No information will be lost and the stopwatches and distance displays will continue operation as normal - when the external power returns, it will be used to power the unit.

If the unit is on battery power, the colon in the middle display stopwatch will flash twice per second.

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External Power

The unit can be powered from an 8v-16v externally fused DC power supply via either the right hand DC power socket or the left hand 8-way socket via the splitter box (see *Connections*).

If unit is on external power, the colon in the middle display will be constantly displayed.

If the external power is applied with reverse polarity (i.e. +12v and Ground swapped) the unit will not power up. The unit will not suffer any electrical damage if this occurs.

Buttons

As the buttons are multi-function, they are described in this manual simply as:

- the ***T***op button or ***T*** – the black button, top right
- the ***M***iddle button or ***M*** – the red button, middle right
- the ***B***ottom button or ***B*** – the black button, bottom right
- the ***R***oamer***T***ime button or ***RT*** – the red button, bottom left.

Some buttons have multiple actions dependent on how long they are pressed. The different length of the presses are:

- short - up to 2 seconds
- medium - between 2 and 5 seconds
- long - between 5 and 8 seconds
- very long - more than 8 seconds
- ...however, you will not need to time these accurately to use the unit - just press the button until the desired result is visible.

Checking/Changing the Mode

The current mode can be checked and the mode changed by using the ***M*** and ***RT*** buttons.

To check the current mode, press and hold ***M*** and then press and release ***RT*** - this will display the current mode plus the Time of Day in hh.mm format. To stay in that mode, release ***M.***

To change the modes, press and hold ***M*** and each press and release of ***RT*** (after the first, which shows the current mode) selects the next mode - when the desired mode is reached, release ***M*** and the displays for that mode will be shown.

All modes can be displayed, even those not licenced for distance use.

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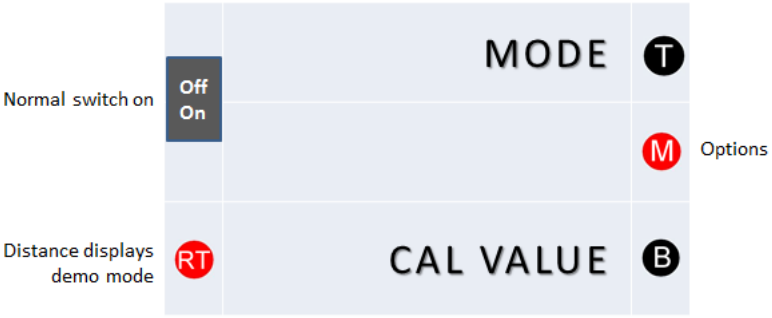
Turning the Unit On

The unit is turned on using the rocker switch on the front panel. The name of the current mode and the current calibration value will be shown and, after about 3 seconds, the normal displays will be shown.



There are two other features that can be initiated when turning the unit on:

- Show, and if required, adjust the unit options - press and hold ***M*** while turning the unit on. See *Options* for more details
- start the unit in demonstration mode - press and hold ***RT*** while turning the unit on. Demonstration mode is confirmed by the current calibration value flashing, and the unit will remain in demonstration mode until powered off - see *Demonstration Mode* for more details.

Options

The unit has a number of options that you can set to determine how some parts of the unit operate and/or how the displays are shown. The options are selected by turning the unit on with ***M*** pressed.

The different options are selected by pressing ***T***, and the value of the option is set by pressing ***B*** one or more times. To leave the options, press ***M*** – the unit will then start normally.

The options are:

- number of decimal places on the distance displays – top line shows ***dISt/dEC/PLACE*** and values on the bottom line are 0.1 or 0.01. If the option is set to 0.1 then the distance displays are shown to one decimal place; if set to 0.01 then the distance displays are shown to two decimal places. The rest of this manual assumes the option is set to 0.01 (i.e. distances displayed to two decimal places)

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- whether leading zeroes are shown on the stopwatches – top line shows ***StOP/UAtCH/ZEROS*** and values on the bottom line are 0.00.00 or 0.00. If the option is set to 0.00.00 then the stopwatch displays have their leading zeroes shown; if the option is set to 0.00 then the stopwatch displays have their leading zeroes blanked
- how the M button operates the stopwatch in Regularity Mode – top line shows ***REGUL/StOP/UAtCH*** and values on the bottom line are Add 5, Sub 5, Set 0 and Set 60. See *Regularity Mode* for how these values affect the regularity mode stopwatch
- how long the 24 hour clock is frozen for when the RT button is pressed in Stage Mode – top line shows ***HOLd/StAGE/CLOC*** and values on the bottom line are 0 (i.e. not frozen), 15, 30, 45, 60, 75, 90, 120, 150, 180, 210 or 240 seconds.

The final option shows various details about the unit – they cannot be changed:

- top display – the modes licenced to the unit. The licenced mode names are displayed in a loop with the display showing:
    - ***bASIC*** – basic mode (always a licenced mode)
    - ***ROAd*** – if road mode is licenced for the unit
    - ***SPEEd*** – if speed mode is licenced for the unit
    - ***RALLY*** – if rally mode is licenced for the unit
    - ***REGUL*** – if regularity mode is licenced for the unit
    - ***StAGE*** – if stage mode is licenced for the unit
    - ***tOtAL*** – if totals mode is licenced for the unit
    - …if a mode name is not shown, then it is not licenced for the unit. Contact The Basic Roamer Company if you want to licence new modes
- middle display - the unit serial number
- bottom display - the software version – 1.52.x

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Basic Mode - Displays and Buttons

Basic Mode shows Time of Day plus two independent stopwatches with a transfer and hold function. The mode is used for general timing of road, regularity or stage rally sections.

T and ***B*** affect the stopwatch next to them:

- a short press will start the stopwatch
- the next short press will pause the stopwatch display (although the stopwatch will continue running in the background)
- the next short press will restart the stopwatch display, with the displayed time resuming at the time that the stopwatch has now reached
- a medium press will reset the stopwatch to a stopped value of 0.00.00 – a short press will then start the stopwatch.

M has different effects depending on how long it is pressed for:

- a short press controls the display visibilities - see *Display Visibilities*
- a medium press will allow the display brightness to be changed - see *Display Brightness*
- a long press will allow the distance calibration to be set - see *Distance Calibration*
- a very long press will allow the Time of Day clock to be set - see *Time Of Day*.

RT has different effects depending on how long it is pressed for:

- a short press:
  - copies the top stopwatch time to the bottom stopwatch, which is then stopped
  - the top stopwatch is zeroed and restarted
- a medium press will zero and stop both stopwatches.

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Basic Mode - Additional Info

Both stopwatches continue to run in the background even when the unit is in a different mode. A stopwatch can still be controlled even if the display visibility is such that it is not able to be seen.

The stopwatches will also operate as normal while the unit is powered off (and even when the 6xAA batteries discharge or are removed) - when it is powered on (or fresh batteries are inserted), the stopwatch displays will account for the period of time that the unit was switched off, however long that may be.

The maximum stopwatch time is 9 hours 59 minutes 59 seconds (i.e. a display value of 9.59.59). The stopwatch will then roll over to 0.00.00

The stopwatches display whole seconds only, but the internal resolution is 0.1 seconds.

It is easy to see the status of a stopwatch:

- when running normally i.e. the watch display is counting up, there is no dot at the right hand end of the time
- when paused i.e. the display is not changing but the watch is running in the background, a flashing dot appears at the right hand end of the time
- when stopped i.e. the watch display is not changing and the watch is not running in the background, a solid dot appears at the right hand end of the time

Using Basic Mode on an Event

The Basic Mode independent stopwatches can be used as required on any event.

If you want to start timing at the start of a competitive section, a medium press of ***RT*** will zero and stop both stopwatches. Then, when you want to start timing, you can either:

- just short press ***RT*** again - this will perform the standard ***RT*** action of copying the top stopwatch time to the bottom stopwatch and restarting the top watch - but as the stopwatches will already be zero, the net effect is that the top stopwatch will start
- just short press ***B*** - this will start the bottom stopwatch.

If you are on a regularity section of a road event, and you are obtaining distances from another source e.g. the vehicle odometer, then ***RT*** is useful as you entering a regularity control - a short press will transfer the time since the last control to the bottom stopwatch for easy reference and restart the top watch to immediately so that it can show the elapsed time to the next control.

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Road Mode - Displays and Buttons

Road Mode shows Time of Day plus total and trip distance displays. The mode is used for general road distance timing including navigating between competitive sections by following event road books.

T has different effects depending on how long it is pressed for:

- a short press zeroes the total distance
- if the remote unit is not fitted, a medium press will reverse the direction of all road, rally and regularity distances - initially the total distance will go to 0.00, but continue to hold ***T*** until the total distance shows the original value and then release ***T***...the road, speed, rally and regularity distances will now be running in the opposite direction. If the remote unit is fitted, a medium press has no effect

M has different effects depending on how long it is pressed for:

- a short press controls the display visibilities - see *Display Visibilities*
- a medium press will allow the brightness to be changed - see *Display Brightness*
- a long press will allow the distance calibration to be set - see *Distance Calibration*
- a very long press will allow the Time of Day clock to be set - see *Time Of Day*.

B has different effects depending on how long it is pressed for:

- a short press zeroes the trip distance
- if the remote unit is not fitted, a medium press will reverse the direction of all road, rally and regularity distances - initially the trip distance will go to 0.00, but continue to hold ***B*** until the trip distance shows the original value and then release ***B***...the road, speed, rally and regularity distances will now be running in the opposite direction. If the remote unit is fitted, a medium press has no effect.

A medium press of ***RT*** zeroes the total and trip distances.

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Road Mode - Additional Info

The total and trip distances continue to run in the background even when the unit is in a different mode. The distance display values and direction are retained when the unit is switched off and/or the batteries removed.

The total and trip distances always run in the same direction as the distances in Rally and Regularity Modes:

- if a remote unit is fitted, their direction is controlled by the rocker switch on the remote unit and medium presses of any button next to a distance in any of these modes has no effect
- if a remote unit is not fitted, their direction is controlled by medium presses of any button next to a distance in any of these modes (and they cannot be paused).

It is easy to see the status of the distances:

- when running normally i.e. the displays are counting up, there is no dot at the right hand end of the distances
- when paused i.e. the displays will not be changing, a solid dot appears at the right hand end of the distances
- when running backwards i.e. the display are counting down, there is a flashing dot at the right hand end of the distances.

The display resolution is either 0.01 or 0.001 mile/km depending on the *Options* selected, but the internal accuracy is 1 pulse from the distance sensor which is typically less than 1 yard/1 metre.

The maximum distance is 999.99. Leading zeroes are not displayed i.e. 2.63 miles is displayed as 2.63, not 002.63. When the displays are:

- running forwards, the next displayed value after 999.99 is 0.00
- running backwards, the next displayed value after 0.00 is 999.99

The distance displays do not change if Road Mode is not licenced for a unit even if a distance sensor is connected. However, they do change when the unit is in demonstration mode whether Road Mode is licenced or not - see *Demonstration Mode*.

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Using Road Mode on an Event

The Road Mode independent distance displays can be used, when Road Mode is licenced for a unit, on any event or section of an event, where you need a total distance travelled plus the ability to reset an intermediate distance display to zero at appropriate times/locations, for example:

- when following "road book" type instructions (e.g. on road sections between special stages), where tulip diagrams are given with their total distance from the start and intermediate distance from the last one
- on road rally selectives where you want to monitor the total distance into a selective whilst resetting the trip distance at various locations so you can use it to measure the distance to, say, a difficult to find slot into an unmarked white.

A medium press of ***RT*** at the start of a section to be measured will zero both distance displays. At intermediate points, a short press of ***B*** will zero the trip distance.

If you make a "wrong slot" then when you realise you have done so, you may want to remove the distance travelled incorrectly from the distance displays. To do this accurately if you have a remote unit:

- at a point where you can turn around set the rocker switch on the remote unit to Pause - this will stop the distance display changing as you turn around
- when you have turned around, set the rocker switch on the remote unit to Reverse - this will make the distance run backwards until you rejoin the route at the correct point...
- ...and then set the displays to run forwards again by setting the rocker switch on the remote unit to Forward.

The same effect can be achieved if you don't have a remote unit by changing the direction of the displays via a medium press of ***T*** or ***B***:

- in the middle of the turning round manoeuvre
- at the point that you re-join the correct route.

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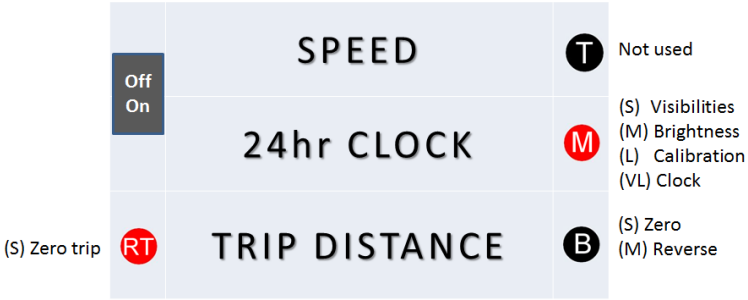
Speed Mode - Displays and Buttons

Speed Mode shows Time of Day plus current speed and a trip distance. The mode is for general road use and for when travelling through non-competitive/neutral sections. Average speed is NOT measured or shown by the unit.



T has no effect.

M has different effects depending on how long it is pressed for:

- a short press controls the display visibilities - see *Display Visibilities*
- a medium press will allow the display brightness to be changed - see *Display Brightness*
- a long press will allow the distance calibration to be set - see *Distance Calibration*
- a very long press will allow the Time of Day clock to be set - see *Time Of Day.*

B has different effects depending on how long it is pressed for:

- a short press zeroes the trip distance
- if the remote unit is not fitted, a medium press will reverse the direction of all road, rally and regularity distances - initially the trip distance will go to 0.00, but continue to hold ***B*** until the trip distance shows the original value and then release ***B***...the road, speed, rally and regularity distances will now be running in the opposite direction. If the remote unit is fitted, a medium press has no effect.

RT affects the trip distance:

- a short press zeroes the trip distance.

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Speed Mode - Additional Info

Speed

The speed display:

- is shown as whole numbers only - 29, 30, 31, … etc.
- is updated at all times, even when the trip distance is paused
- is rounded to the nearest whole number (i.e. a speed of 32.4 is shown as 32) and there is no inbuilt "over-estimate" of the displayed speed.

Average speed is NOT measured or shown by the unit – this allows the use of a ***RoamerTime+*** on events where using a unit showing average speed is either not allowed or attracts a timing penalty.

Speed is calculated using the current calibration value. If the calibration value represents exactly 1 mile/km when measured on a "real" road then it will be accurate. If the calibration value represents an organiser's "measured mile/km", which may not be exactly 1 mile/km on the road, then the speed will not be accurate e.g. if the "measured mile" is actually 1.1 miles on the road, then the displayed speeds will be 10% too high.

Trip Distance

The trip distance continues to run in the background even when the unit is in a different mode. The distance display value and direction is retained when the unit is switched off and/or the batteries removed.

The trip distance always runs in the same direction as the distances in Road, Rally and Regularity Modes:

- if a remote unit is fitted, their direction is controlled by the rocker switch on the remote unit and medium presses of any button next to a distance in any of these modes has no effect
- if a remote unit is not fitted, their direction is controlled by medium presses of any button next to a distance in any of these modes (and they cannot be paused).

It is easy to see the status of the trip distance:

- when running normally i.e. the displays are counting up, there is no dot at the right hand end of the distance
- when paused i.e. the display will not be changing, a solid dot appears at the right hand end of the distance

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- when running backwards i.e. the display is counting down, there is a flashing dot at the right hand end of the distance.

The display resolution is either 0.1 or 0.01 mile/km depending on the *Options* selected, but the internal accuracy is 1 pulse from the distance sensor which is typically less than 1 yard/1 metre.

The maximum distance is 999.99. Leading zeroes are not displayed i.e. 2.63 miles is displayed as 2.63, not 002.63. When the displays are:

- running forwards, the next displayed value after 999.99 is 0.00
- running backwards, the next displayed value after 0.00 is 999.99

The distance display does not change if Speed Mode is not licenced for a unit even if a distance sensor is connected. However, it does change when the unit is in demonstration mode whether Speed Mode is licenced or not - see *Demonstration Mode*.

Using Speed Mode on an Event

There are two things to remember about the accuracy of the displayed speed:

- the speed calculation assumes that the unit has been calibrated so that 1.00 mile/km on the distance displays corresponds to an actual road distance of 1.00 mile/km. If the unit has been calibrated so that 1.00 mile/km on the distance displays is ***not*** 1.00 mile/km on the road (e.g. the organisers measured distance is not accurate to real road distance) then the speed shown may not be accurate compared with other speed measuring devices (in-car speedometer, GPS units, radar guns etc)
- performing a Distance Adjustment – see *Distance Adjustment* – affects the calibration value, so this might also affect the accuracy of the displayed speed.

The ***RoamerTime+*** unit has no legal or technical certification that the speed displayed at any time is the actual vehicle speed.

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Rally Mode - Displays and Buttons

Rally Mode shows Time of Day plus a stopwatch and a trip distance. The mode is used for selective sections on road rallies. The trip distance can be set to run backwards to allow, for instance, "wrong slots" to be removed from the overall distance travelled.

T affects the stopwatch:

- a short press will start the stopwatch
- the next short press will pause the stopwatch display (although the stopwatch will continue running in the background)
- the next short press will restart the stopwatch display, with the displayed time resuming at the time that the stopwatch has now reached
- a medium press will reset the stopwatch to a stopped value of 0.00.00 – a short press will then start the stopwatch.

M has different effects depending on how long it is pressed for:

- a short press controls the display visibilities - see *Display Visibilities*
- a medium press will allow the display brightness to be changed - see *Display Brightness*
- a long press will allow the distance calibration to be set - see *Distance Calibration*
- a very long press will allow the Time of Day clock to be set - see *Time Of Day*.

B has different effects depending on how long it is pressed for:

- a short press zeroes the trip distance
- if the remote unit is not fitted, a medium press will reverse the direction of all road, rally and regularity distances - initially the trip distance will go to 0.00, but continue to hold ***B*** until the trip distance shows the original value and then release ***B***...the

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road, speed, rally and regularity distances will now be running in the opposite direction. If the remote unit is fitted, a medium press has no effect.

RT has different effects depending on how long it is pressed for:

- a short press zeroes the stopwatch and trip distance, with the stopwatch restarting straight away
- a medium press zeroes the stopwatch and trip distance, but the stopwatch does not restart.

Rally Mode - Additional Info

Stopwatch

The stopwatch continues to run in the background even when the unit is in a different mode. The stopwatch can still be controlled even if the display visibility is such that it is not able to be seen.

The stopwatch will also operate as normal while the unit is powered off (and even when the 6xAA batteries discharge or are removed) - when it is powered on (or fresh batteries are inserted), the stopwatch displays will account for the period of time that the unit was switched off, however long that may be.

The maximum stopwatch time is 9 hours 59 minutes 59 seconds (i.e. a display value of 9.59.59). The stopwatch will then roll over to 0.00.00

The stopwatch displays whole seconds only, but the internal resolution is 0.1 seconds.

It is easy to see the status of the stopwatch:

- When running normally i.e. the watch display is counting up, there is no dot at the right hand end of the time
- When paused i.e. the display is not changing but the watch is running in the background, a flashing dot appears at the right hand end of the time
- When stopped i.e. the watch display is not changing and the watch is not running in the background, a solid dot appears at the right hand end of the time

Trip Distance

The trip distance continues to run in the background even when the unit is in a different mode. The trip distance display value and direction are retained when the unit is switched off and/or the batteries removed.

The trip distance always runs in the same direction as the distances in Road and Regularity Modes:

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- if a remote unit is fitted, its direction is controlled by the rocker switch on the remote unit and medium presses of any button next to a distance in any of these modes has no effect
- if a remote unit is not fitted, its direction is controlled by medium presses of any button next to a distance in any of these modes (and it cannot be paused).

It is easy to see the status of the trip distance:

- when running normally i.e. the trip distance display is counting up, there is no dot at the right hand end of the distance
- when paused i.e. the display will not be changing, a solid dot appears at the right hand end of the distance
- when running backwards i.e. the trip distance display is counting down, there is a flashing dot at the right hand end of the distance.

The display resolution is either 0.01 or 0.001mile/km depending on the *Options* selected, but the internal accuracy is 1 pulse from the distance sensor which is typically less than 1 yard/1 metre.

The maximum trip distance is 999.99. Leading zeroes are not displayed i.e. 2.63 miles is displayed as 2.63, not 002.63. When the trip display is:

- running forwards, the next displayed value after 999.99 is 0.00
- running backwards, the next displayed value after 0.00 is 999.99

The trip distance display does not change if Rally Mode is not licenced for a unit even if a distance sensor is connected. However, it does change when the unit is in demonstration mode whether Rally Mode is licenced or not - see *Demonstration Mode*.

Using Rally Mode on an Event

The following techniques are suggestions for operating the unit on road rally selective sections when Rally Mode is licenced for a unit. However, there will be variations on these and it is best to try different methods to find the ones you are most comfortable with.

At the selective start

At the selective start control, with the vehicle stationary, a medium press of ***RT*** will zero the distance display and zero the stopwatch, holding it at zero with a solid dot at the end of the time.

At your start time, a short press of ***RT*** will zero the stopwatch (although it is already zero), remove the solid dot and start it running.

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During the selective

As you progress through the selective you may wish to call bends/junctions in terms of distance to go from a known position. To do this, a short press of ***B*** at the known position will reset the distance display to zero so that the distance to go to the bend/junction can be easily seen.

If you don't want to call bends/junctions in terms of distance to go, then simply leave the distance display to increase as you drive the selective - this can then be compared with the total selective length to allow you to determine how far it is to the finish at any time

As you progress through the selective the stopwatch will be measuring the time taken so far.

If you make a "wrong slot" then when you realise you have done so, you may want to remove the distance travelled incorrectly from the distance display. To do this accurately:

- at a point where you can turn around, set the rocker switch on the remote unit to Pause - this will stop the distance display changing as you turn around
- when you have turned around, set the rocker switch on the remote unit to Reverse - this will make the distance run backwards until you rejoin the route at the correct point...
- ...and then set the rocker switch on the remote unit to Forward to resume measuring the originally correct distance.

At the selective finish

As you approach the selective finish you will be able to tell if you are early or late from the stopwatch and the allowed time for the selective - this avoids having to mentally add the allowed time to your start Time of Day and checking the Time of Day clock as you approach the selective finish. The Time of Day is, of course, always available if you prefer to do that, or you want to use it as a double check of arrival time.

Simple regularity sections

If there is a simple regularity section on a road rally then you can use the stopwatch and the trip distance, plus simple mental arithmetic or speed tables, to monitor actual vs. required average speed (30mph = 0.1 miles every 12 seconds, 0.5 miles every minute etc).

If you need to restart the same or a different average speed, then a short press of ***RT*** at the speed change point (such as a Regularity Intermediate Time Control) will zero the stopwatch and the trip distance, and allow you to restart your calculations from a zero time and distance point.

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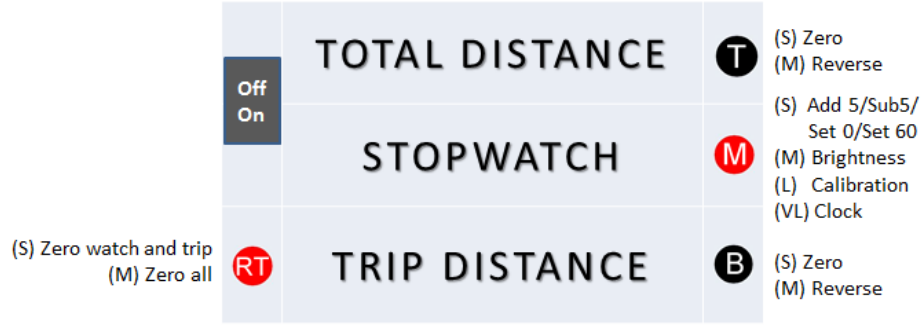
Regularity Mode - Displays and Buttons

Regularity Mode shows a stopwatch plus total and trip distance displays. The mode is used for complex regularity sections where speed changes are needed at total or intermediate distances and/or time allowances are given for crossing other roads/railway lines etc. The distance displays can be set to run backwards to allow "wrong slots" to be removed from the overall distance travelled.



T affects the total distance:

- a short press zeroes the total distance
- if the remote unit is not fitted, a medium press will reverse the direction of all road, rally and regularity distances - initially the total distance will go to 0.00, but continue to hold ***T*** until the total distance shows the original value and then release ***T***...the road, speed, rally and regularity distances will now be running in the opposite direction. If the remote unit is fitted, a medium press has no effect.

M has different effects depending on how long it is pressed for:

- a short press either adds or subtracts 5 seconds from the stopwatch, sets the stopwatch to zero or sets it to 60 seconds (i.e, 1 minute) depending on the *Options* selected – these operations can be used at intermediate controls or when time allowances are given at points in the regularity section - see *Using Regularity Mode on an Event*
- a medium press will allow the display brightness to be changed - see *Display Brightness*
- a long press will allow the distance calibration to be set - see *Distance Calibration*
- a very long press will allow the Time of Day clock to be set - see *Time Of Day.*

B affects the trip distance:

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- a short press zeroes the trip distance
- if the remote unit is not fitted, a medium press will reverse the direction of all road, rally and regularity distances - initially the trip distance will go to 0.00, but continue to hold ***B*** until the trip distance shows the original value and then release ***B***...the road, speed, rally and regularity distances will now be running in the opposite direction. If the remote unit is fitted, a medium press has no effect.

RT has different effects depending on how long it is pressed for:

- a short press zeroes the stopwatch and trip distance, with the stopwatch restarting straight away
- a medium press zeroes the stopwatch, the total distance and the trip distance, but the stopwatch does not restart.

Regularity Mode - Additional Info

Trip and Total Distances

The trip and total distances continue to run in the background even when the unit is in a different mode. The trip and total distance display values and direction are retained when the unit is switched off and/or the batteries removed.

The total and trip distances always run in the same direction as the distances in Road and Rally Modes:

- if a remote unit is fitted, their direction is controlled by the rocker switch on the remote unit and medium presses of any button next to a distance in any of these modes has no effect
- if a remote unit is not fitted, their direction is controlled by medium presses of any button next to a distance in any of these modes (and they cannot be paused).

It is easy to see the status of the trip and total distances:

- when running normally i.e. the distance display are counting up, there is no dot at the right hand end of either distance
- when paused i.e. the displays will not be changing, a solid dot appears at the right hand end of both distances
- when running backwards i.e. the distance displays are counting down, there is a flashing dot at the right hand end of both distances.

The display resolution is either 0.01 or 0.001 mile/km depending on the *Options* selected, but the internal accuracy is 1 pulse from the distance sensor which is typically less than 1 yard/1 metre.

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The maximum distance is 999.99. Leading zeroes are not displayed i.e. 2.63 miles is displayed as 2.63, not 002.63. When the displays are:

- running forwards, the next displayed value after 999.99 is 0.00
- running backwards, the next displayed value after 0.00 is 999.99

The distance displays do not change if Regularity Mode is not licenced for a unit even if a distance sensor is connected. However, they do change when the unit is in demonstration mode whether Regularity Mode is licenced or not - see *Demonstration Mode*.

Stopwatch

The stopwatch continues to run in the background even when the unit is in a different mode.

The stopwatch will continue to operate while the unit is powered off (and even when the 6xAA batteries discharge or are removed) - when it is powered on (or fresh batteries are inserted), the stopwatch display will account for the period of time that the unit was switched off, however long that may be.

The maximum stopwatch time is 9 hours 59 minutes 59 seconds (i.e. a display value of 9.59.59). The stopwatch will then roll over to 0.00.00

The stopwatch displays whole seconds only, but the internal resolution is 0.1 seconds.

It is easy to see the status of a stopwatch:

- when running normally i.e. the watch display is counting up, there is no dot at the right hand end of the time
- when stopped i.e. the watch display is not changing and the watch is not running in the background, a solid dot appears at the right hand end of the time.

Using Regularity Mode on an Event

The following techniques are suggestions for operating the unit on a regularity event, or regularity section of an event, when Regularity Mode is licenced for a unit and a remote unit is used. However, there will be variations on these and it is best to try different methods to find the ones you are most comfortable with.

At the section start

At the section start control, with the vehicle stationary, a medium press of ***RT*** will zero the distance displays and zero the stopwatch, holding it at zero with a solid dot at the end of the time.

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At your start time, a short press of ***RT*** will zero the stopwatch (although it is already zero), remove the solid dot and start it running.

During the section

As you progress through the section, you can use your average speed tables to co-ordinate distance travelled with time taken by using the stopwatch and trip distance displays.

At speed change points, indicated by either a given distance from the last reference point (i.e. as shown on the trip distance display) or a given distance from the start (i.e. as shown on the total distance display), a short press of ***RT*** will zero and restart the stopwatch, ***and*** zero the trip display to enable the new average speed to be monitored.

Some events will give a time allowance on the section for crossing main roads/railway crossings etc. With *Options* set to "Sub 5", this time allowance can be easily accounted for by a brief press of ***M***, with each press removing 5 seconds from the stopwatch value. So, for example, if the time allowance for crossing a main road is 25 seconds:

- at the main road, briefly press ***M*** five times to subtract 25 seconds from the stopwatch
- find your new time position in the average speed tables for the stopwatch value - this will indicate a lesser distance than you have travelled so far, but after crossing the main road (whether it took 5 seconds, 25 seconds or 45 seconds) your stopwatch time will have a value that you need to reconcile with the trip distance display to maintain the required average speed.

During a section you may be running late at a speed change point. With *Options* set to "Add 5", you can account for this late time by adding 5 seconds to the stopwatch with each brief press of ***M***, similar to the above.

Alternatively, you may want to have control of the stopwatch at any time, in which case with *Options* set to "Set 0", a brief press of M will zero the stopwatch, with it restarting immediately.

Finally, you may want to be able to set the stopwatch to an initial value of 1 minute, in which case with *Options* set to "Set60", a brief press of M will set the stopwatch to 1 minute 0 seconds, with it restarting immediately. This option can be used at a time of day 1 minute after the previous control arrival time (as written on your time card by the marshal), to allow accurate timing on the new section by using your speed tables with the stopwatch time and the trip distance value.

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Stage Mode - Displays and Buttons

Stage Mode shows Time of Day plus a 0.1 second resolution stopwatch and a distance display. The mode is used for special stages. The stopwatch auto-starts when the vehicle starts moving at the stage start and a single button press at the flying finish will freeze the stopwatch and distance displays.

A short press of ***T*** zeroes and restarts the stopwatch.

M has different effects depending on how long it is pressed for:

- a medium press will allow the display brightness to be changed - see *Display Brightness*
- a long press will allow the distance calibration to be set - see *Distance Calibration*
- a very long press will allow the Time of Day clock to be set - see *Time Of Day*.

A short press of ***B*** zeroes the distance.

As short press of ***RT*** cycles through three operations:

- zeroes the stopwatch and distance and arms the unit for an auto-start of the stopwatch when the vehicle moves - and the dots to the right of the stopwatch and distance will flash
- if the vehicle has not moved (and so the stopwatch has not yet auto-started) the stopwatch is started - and the flashing dots to the right of the stopwatch and distance will disappear
- if the stopwatch is running (i.e. has either auto-started or been started by ***T*** or ***RT***) the stopwatch, Time of Day Clock and distance displays are frozen - and the dots to the right of each display line will be solid. The Time of Day clock will be frozen for the number of seconds in *Options*, and will then resume normally. The Time of Day clock can be made to resume at any time that it is frozen by pressing ***M*** – it will also

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resume if you press ***T***, ***B*** or ***RT***, but the normal actions associated with them will also take place.

Stage Mode - Additional Info

Stopwatch

The stopwatch continues to run in the background even when the unit is in a different mode.

The stopwatch will continue to operate while the unit is powered off (and even when the 6xAA batteries discharge or are removed) - when it is powered on (or fresh batteries are inserted), the stopwatch display will account for the period of time that the unit was switched off, however long that may be.

The stopwatch auto starts on the 2nd pulse from the distance sensor. This means that the stopwatch will only auto start if there is a definite vehicle movement - any vibration or minor movement of the vehicle at the stage start will not start the stopwatch.

The maximum stopwatch time is 59 minutes 59 seconds 9 tenths (i.e. a display value of 59.59.9). The stopwatch will then roll over to 00.00.0 and continue.

It is easy to see the status of the stopwatch:

- when running normally i.e. the watch display is counting up, there is no dot at the right hand end of the time
- when frozen i.e. the watch display is not changing and the watch is not running in the background, a solid dot appears at the right hand end of the time
- when armed, a flashing dot appears at the right hand end of the time.

Distance

The distance display continues to run in the background even when the unit is in a different mode. The distance display value is retained when the unit is switched off and/or the batteries removed.

The distance display only runs forward - it cannot be paused or set to run backwards via the front panel buttons, and the position of the rocker switch on the remote unit has no effect.

It is easy to see the status of the distance:

- when running normally i.e. the distance display is counting up, there is no dot at the right hand end of the distance
- when frozen i.e. the display will not be changing, a solid dot appears at the right hand end of the distance

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- when the distance is armed - see *Auto-Start* below - a flashing dot appears at the right hand end of the distance.

The display resolution is either 0.01 or 0.001 mile/km depending on the *Options* selected, but the internal accuracy is 1 pulse from the distance sensor which is typically less than 1 yard/1 metre.

The maximum distance is 999.99. Leading zeroes are not displayed i.e. 2.63 miles is displayed as 2.63, not 002.63. When the displays are:

- running forwards, the next displayed value after 999.99 is 0.00
- running backwards, the next displayed value after 0.00 is 999.99

The distance display does not change if Stage Mode is not licenced for a unit even if a distance sensor is connected. However, it does change when the unit is in demonstration mode whether Stage Mode is licenced or not - see Demonstration Mode.

Using Stage Mode on an Event

The following techniques are suggestions for operating the unit on stage rally special stage when Stage Mode is licenced for a unit. The operation is very simple and only normally requires use of ***RT***

At the stage start

At the stage start, and with the vehicle stationary, briefly press ***RT*** until the stopwatch and the distance display are zeroed and there is a flashing dot at the right hand end of each - the unit is now "armed". The stopwatch will start automatically when the vehicle moves and distance sensor pulses are received, or can be started manually via a short press of ***RT.***

During the stage

Normally, nothing needs to be done during the stage - the stopwatch and distance will increase as you travel through the stage.

If you want to reset the distance to zero at any point, briefly press ***B***.

At the stage end

As you cross the flying finish, briefly press ***RT*** - this will freeze the stopwatch, Time of Day clock and distance display, showing you your stage time, the Time of Day you passed the flying finish and distance travelled.

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Totals Mode - Displays and Buttons

Totals Mode shows Time of Day plus total time and total distance displays. The mode can used to check or record the total distance travelled, plus the total amount of time that the vehicle has been moving.

A medium press of ***T*** zeroes the total time.

M has different effects depending on how long it is pressed for:

- a medium press will allow the display brightness to be changed - see *Display Brightness*
- a long press will allow the distance calibration to be set - see *Distance Calibration*
- a very long press will allow the Time of Day clock to be set - see *Time Of Day*.

A medium press of ***B*** zeroes the total distance.

A medium press of ***RT*** zeroes the total time and the total distance.

Totals Mode - Additional Info

Total Time

Total time accumulates only when the vehicle in moving. The time continues to run in the background (providing the vehicle is moving) even when the unit is in a different mode. The total time is retained while the unit is powered off.

The time pauses when the vehicle has been stationary for 1 second.

It is easy to see the status of the total time:

- when running normally i.e. the vehicle is moving, there is no dot at the right hand end of the time

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- when paused, because the vehicle is not moving, a solid dot appears at the right hand end of the time.

The maximum time is 9 hours 59 minutes 59 seconds (i.e. a display value of 9.59.59). The time will then roll over to 0.00.00

Total time display does not change if Totals Mode is not licenced for a unit even if a distance sensor is connected, since it requires distance sensor pulses to keep it running. However, it does change when the unit is in demonstration mode whether Totals Mode is licenced or not - see *Demonstration Mode*

Total Distance

The total distance continues to run in the background even when the unit is in a different mode. The total distance display value is retained when the unit is switched off and/or the batteries removed.

The total distance display only runs forward when the vehicle is in motion - it cannot be paused or set to run backwards via the front panel buttons, and the position of the rocker switch on the remote unit has no effect.

It is easy to see the status of the total distance:

- when running normally i.e. the distance is counting up, there is no dot at the right hand end of the distance
- when paused i.e. the vehicle is not moving, a solid dot appears at the right hand end of the distance

The display resolution is either 0.01 or 0.001 mile/km depending on the *Options* selected, but the internal accuracy is 1 pulse from the distance sensor which is typically less than 1 yard/1 metre.

The maximum total distance is 999.99. Leading zeroes are not displayed i.e. 2.63 miles is displayed as 2.63, not 002.63. When the displays are:

- running forwards, the next displayed value after 999.99 is 0.00
- running backwards, the next displayed value after 0.00 is 999.99

The total distance display does not change if Totals Mode is not licenced for a unit even if a distance sensor is connected. However, it does change when the unit is in demonstration mode - see *Demonstration Mode*.

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Using Totals Road Mode on an Event

Using the unit when Totals Mode is licenced is very simple - a medium press of ***RT*** at the start of the event will zero the distance and time.

The time or distance can be independently set to zero at any time by a medium press of ***T*** or ***B*** respectively.

Display Visibilities

In Basic, Road and Rally modes the visibility of the top and bottom displays can be controlled allowing the amount of information shown to be reduced if it is not needed.

The display visibilities cannot be changed in the other modes as all displays are needed at all times.

The visibility combinations in Basic Mode are:

- top stopwatch displayed, bottom stopwatch displayed
- top stopwatch not displayed, bottom stopwatch displayed
- top stopwatch not displayed, bottom stopwatch not displayed
- top stopwatch displayed, bottom stopwatch not displayed.

The visibility combinations in Road Mode are:

- total distance displayed, trip distance displayed
- total distance not displayed, trip distance displayed
- total distance not displayed, trip distance not displayed
- total distance displayed, trip distance not displayed.

The visibility combinations in Rally Mode are:

- stopwatch displayed, trip distance displayed
- stopwatch not displayed, trip distance displayed
- stopwatch not displayed, trip distance not displayed
- stopwatch displayed, trip distance not displayed.

Display visibilities are changed by a short press and release of ***M***. The order of display visibilities is as above. All stopwatches and distance displays in Basic, Road and Rally Mode still continue to operate as normal even when they are not visible.

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Display Brightness

The display brightness can be changed in any mode:

- a medium press of ***M*** will change the top and bottom displays to "br uP" and "br dn" – release ***M*** when these are shown
- each press of ***T*** or ***B*** will increase or decrease the display brightness – each press changes the brightness by one step
- when the required brightness is reached, press ***M*** to return to the normal displays.

There are 15 display brightness levels. The display brightness is remembered when the unit is switched off – when the unit is switched on, the display brightness will be the same as it was when last switched off.

When pressing ***T*** or ***B*** to change the brightness, the brightness will eventually become the maximum or minimum. When this happens, a dot will appear next to ***T*** or ***B*** as appropriate. Pressing the ***T*** or ***B*** when the dot is next to it has no effect.

Time of Day, the stopwatches and the distance displays still continue to operate as normal in the background when changing display brightness – no time or distance information is lost however long you take changing the brightness, or how often you do it.

The brighter the display, the quicker the 6x AA batteries will discharge – but if the unit is externally powered and batteries are also fitted, the internal batteries are not affected by brightness changes, since the external supply will power the unit in this situation.

Time of Day

Time of Day is shown in all modes except Regularity, and is displayed on the middle display as a 24 hour clock.

Time of Day is maintained when the unit is switched off – and even when the 6xAA batteries go flat or are removed, or the external power is disconnected.

The colon between hours and minutes is solid if the unit is using external power and flashing if the unit is using internal battery power.

To set the Time of Day in any mode:

- a very long press and hold of ***M*** will change the top and bottom displays to "Cl uP" and "Cl dn" – release ***M*** when these are shown (note that during this time the display will go through the brightness and calibration settings – however the brightness and calibration will not change)

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- the hours values will be flashing. Press ***T*** or ***B*** to increase or decrease the value to that required and then press ***M***
- the minutes values will be flashing. Press ***T*** or ***B*** to increase or decrease the value to that required and then press ***M***
- the seconds values will be flashing. Press ***T*** or ***B*** to increase or decrease the value to that required. Press ***M*** to set the whole clock value to that shown and the unit will then return to the current mode.

The Time of Day only stops when any of the hours, minutes or seconds is adjusted.

All stopwatches and the distance displays still continue to operate as normal in the background when setting Time of Day – no time or distance information is lost however long you take changing the Time of Day, or how often you repeat the process. However, if you have any stopwatches running when adjusting the Time of Day and you then switch the unit on and off without resetting them, the time on the stopwatches may not be correct.

Calibration

The distance calibration needs to be set before use by setting a "calibration value" which is the number of sensor pulses received by the unit for a given distance. This may vary with different wheel/tyre combinations. The calibration value can be set by:

- driving a measured distance (normally 1 mile or 1 km, but can be any distance)
- entering the value manually.

The calibration value can be between 100 and 99,999 and is retained by the unit when powered off or, if on battery power, the 6xAA batteries discharge or the batteries are removed.

To set the calibration value by driving a measured distance:

- drive to the start of the measured distance and stop the vehicle
- press and hold ***M*** until the top and bottom displays change to "CA uP" and "CA dn" – then release ***M*** (note that the display will go through the brightness setting – however the brightness will not change)
- the current calibration value will be displayed and the 10000's values will be flashing
- press ***RT*** to zero the calibration value
- drive the measured distance – the calibration value will increase by 1 for each distance sensor pulse received. The 10000's value will keep flashing while driving
- Stop the vehicle accurately at the end of the measured distance

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- Press ***M*** five times - the flashing value will move to the right and on the fifth press, the following will be displayed:
    - The calibration distance – set, initially, to 1.000, next to ***T***
    - ***dISt uP***, next to ***M***
    - ***dn***, next to ***B***
- adjust the calibration distance using ***M*** or ***B*** to the distance that the organisers have provided for the section you have just driven – this might be 1.000 miles/km, or might be some other value. When you have adjusted the value as required (single presses, or press and hold), press ***T*** and the appropriate calibration value will be set (limited to between 100 and 99,999 depending on the calibration value and distance) and the unit will return to the normal display.

Note that, as you drive the measured distance, the calibration value will respect the position of the remote unit rocker switch – it will run either forward, be paused, or run backwards.

To set the calibration value manually, for example if there is no measured distance and you already know an accurate value for your current wheel/tyre combination:

- press and hold ***M*** until the top and bottom displays change to "CA uP" and "CA dn" – then release ***M*** (note that the display will go through the brightness setting – however the brightness will not change)
- the current calibration value will be displayed and the 10,000's values will be flashing. Press ***T*** or ***B*** to increase or decrease the value to that required and press ***M***
- the 1000's value will be flashing. Press ***T*** or ***B*** to increase or decrease the value to that required and press ***M***
- the 100's value will be flashing. Press ***T*** or ***B*** to increase or decrease the value to that required and press ***M***
- the 10's value will be flashing. Press ***T*** or ***B*** to increase or decrease the value to that required and press ***M***
- the 1's value will be flashing. Press ***T*** or ***B*** to increase or decrease the value to that required. Press ***M*** to see the display to adjust the calibration distance (see above) - you will normally leave the value as 1.00/1.000 but you can adjust it if you want - and then press ***T*** to set the calibration value and the unit will then return to the normal display.

When the top and bottom displays change to "CA uP" and "CA dn", the current calibration value is displayed – if you don't want to change it, just press ***M*** five times and accept the 1.000 calibration distance by pressing ***T***.

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Distance Adjustment

This advanced feature makes it is possible to make adjustments to the distances displayed on the unit without entering new calibration values manually or doing complicated recalibration calculations. This is particularly useful when you notice, during an event, that the displayed distances do not match the organisers distance by a constant amount – despite seemingly accurate calibration. This may happen if the organiser's units were not actually calibrated using the same distance that you used or different driving lines were taken by the organisers etc.

Distance adjustment can be done when:

- in Road or Regularity mode
- the total distance display is greater than zero.

To perform a distance adjustment press and hold ***T*** until:

- the total distance display resets to zero – continue to hold ***M***
- the total distance display returns to previous value, but would now be running backwards – continue to hold ***M***
- the middle display shows "AdJ uP" and the bottom display shows "dn" – release ***M.***

The total distance display value will now be displayed to three decimal places and frozen; however note that the unit is still responding to sensor pulses and measuring total distance.

Adjust the total display distance to the required value using ***M*** and ***B***. These can be held down to constantly increment/decrement the value. When the required value is shown, press ***T*** briefly. This will:

- automatically recalculate, and set, the unit's calibration value, depending on the current value of total distance (which if you have been moving will now be different to the initial value that was displayed) and the adjusted displayed distance value
- return the unit to normal operation, with the total distance display set to the new adjusted value
- recalculate and redisplay the value of all other distance displays in all modes, as if they had been measured using the new calibration value.

If the adjustment recalculation causes the new calibration value to be less than 100 or greater than 99999, the display will flash 8 times and the distance values and the calibration value will be unchanged.

An example of using the adjustment feature is that you are following a road book and notice that the total distances being displayed and the road book total distances are different by a

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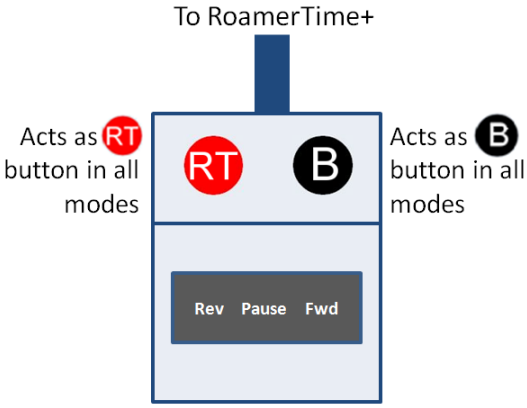
constant (percentage) amount. Whilst travelling to the next junction, perform an adjustment. Although you are still travelling to the next junction, set the adjustment value to the road book value for the next junction, but do not press ***T*** until you get there. This will align the unit's total distance display value to the road book at that junction and recalibrate the unit for the following sections.

Remote Unit

The remote unit provides:

- a red button on the left - which has the same effect as ***RT*** on the unit
- a black button on the right - which has the same effect as ***B*** on the unit
- a rocker switch that controls the trip meters and calibration value when driving the measured distance.



The rocker switch simplifies the control of the distance displays/calibration value:

- when depressed to the right, the distance displays/calibration value run forwards
- when central, the distance displays/calibration value are paused
- when depressed to the left, the distance displays/calibration value run backwards.

When a remote unit is connected, the directions of the distance displays/calibration value cannot be changed via the front panel buttons - the position of the rocker switch takes precedence. The distance displays/calibration value can only be paused using the remote unit rocker switch.

The remote unit can be plugged directly into the unit or into the splitter box - see *Connections*

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Demonstration Mode

The unit can be set to a demonstration mode where it will pretend that it is receiving distance sensor pulses – and so the distance displays will change without having any distance sensor inputs. This allows practice use of all features without having to be in a moving vehicle.

The demonstration mode is set by holding down ***RT*** and then switching the unit on. Demonstration mode will continue until the unit is switched off.

The demonstration mode works by simulating distance sensor pulses arriving at the unit at a fixed rate of 10 pulses per second. This means that the demonstration mode is equivalent to travelling in a vehicle at a fixed speed. However, this speed depends on the unit's current calibration value. If the calibration value is:

- 1200, the simulated speed will be 30 miles/km per hour
- 600, the simulated speed will be 60 miles/km per hour
- 300, the simulated speed will be 120 miles/km per hour etc.

If you change the calibration value to practice using the unit at, say, 60 miles per hour (i.e. by setting the calibration value to 600), remember to make a record of your current calibration value first, and then restore it before using the unit in a vehicle.

Connections

The unit has many ways of being powered and connected, with the most common being:

- completely standalone - internal battery power only, no distance sensor input, no remote unit connected
- internal battery power only, no distance sensor input, remote unit directly connected to 8-way socket
- external power via right hand DC power socket, no distance sensor input, remote unit directly connected to 8-way socket
- internal battery power or external power via the splitter box (or both), distance sensor input connected via splitter box, no remote unit connected or remote unit connected via the splitter box, splitter box connected to 8-way socket.

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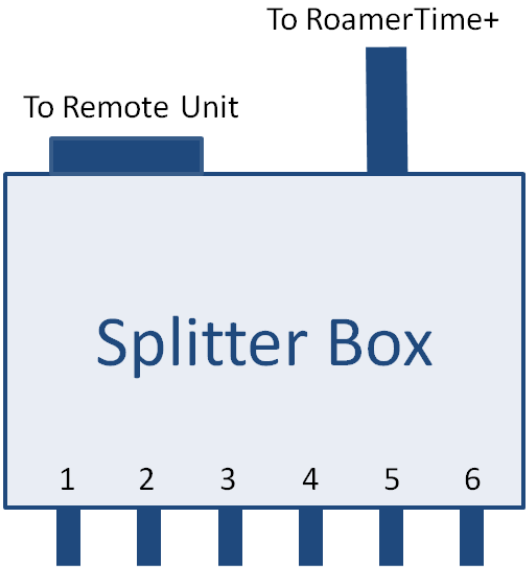

1 – 12v fused in
2 – Ground
3 – Wheel sensor in
4 – 5v supply to speedo sensor
5 – Speedo sensor in
6 – Wheel/speedo sensor ground

The external power supply should have a 5 amp inline fuse. A distance sensor can only be connected via the splitter box.

The unit can accept the following distance sensors:

- two wire proximity sensors – usually detecting wheel bolts, drive shaft/prop shaft rotations etc
- three wire gearbox or speedo cable sensors - that require a 5v supply to operate
- electronic speedo pulses - from digital dashboards, CAN Bus converters, ICE/radio connectors etc.

Proximity sensors can be generic items or Terratrip/Brantz devices etc.

Electronic speedo pulse inputs can be any value from 5v to 12v.

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Mode Licencing

Licences that allow the distance features of ***RoamerTime+*** modes to operate fully are either installed when a unit is purchased, or can be obtained from ***www.thebasicroamer.co.uk***.

When purchasing one or more mode licences, the unit serial number needs to be quoted. This serial number is displayed in *Options*.

You will then be sent, per mode licence, two 4-digit numbers. These are the licence keys for the mode and are specific to the mode and the unit serial number quoted - they will not licence that mode, or any other mode, on any other ***RoamerTime+*** unit.

Installing a Mode Licence

To install a mode licence, the two 4-digit keys that represent the mode licence need to be entered into the unit. This is done by entering them, in order, as "calibration values". The process only has to be done once and is based on the manual calibration entry method described in *Calibration*:

- in any mode, press and hold ***M*** until the displays change to "CA uP" and "CA dn"
- note the existing calibration value - this will be lost when the mode licence is entered
- enter the first 4-digit key as a calibration value with a preceding 0 e.g. if the licence key is 1234 set the calibration value to 01234, and do not change the calibration distance from 1.00/1.000 - the unit will appear to just accept that value and return to the current mode
- press and hold ***M*** until the top and bottom displays change to "CA uP" and "CA dn" again, and manually enter the second 4-digit key (preceded by a zero and do not change the calibration distance from 1.00/1.000) as a calibration value
- If the two keys have been correctly entered in the correct order:
    - the whole display will rapidly flash 8 times and return to the current mode
    - the distance features of the licenced mode will now operate fully
    - the licenced mode will appear in the list in *Options*.

If the two keys have not been correctly entered, the display will not flash, the unit will return to the current mode, and there will be no change to licenced modes list in *Options* . If this happens, repeat the process of entering both two 4-digit keys again until the licence is installed

Remember to re-enter the calibration value that existed before installing the new licence before using the unit in a vehicle. Note that if you repeat the process, and enter the two 4-digit keys for an already-installed licence, you will remove that licence. Just re-enter the keys again to re-install the licence.

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Frequently Asked Questions

General

Q: Does the unit recharge the 6xAA batteries when it is externally powered? If not, why not?
A: No. The 6xAA batteries do not have to be rechargeable (although running costs might be cheaper if they are) and the unit cannot tell if rechargeable or ordinary batteries have been fitted. As it is dangerous to attempt to recharge ordinary batteries, recharging is not done.

Q: Can I usefully use the unit in a vehicle with a distance sensor connected when I power the unit up in demonstration mode?
A: No. The simulated pulses of the demonstration mode will continuously add to the distance display changes caused by the distance sensor

Q: Can I mount the unit in a vehicle by drilling holes in the case and using my own mounting brackets/bolts?
A: No. The inside of the unit is densely packed with circuit boards and components. Drilling holes in the case and/or putting bolts into drilled holes is likely to cause damage to the unit.

Q: Is there any alternative to mounting the unit via the supplied mounting bracket?
A: In low stress situations, such as treasure hunts in a standard road car, you could consider using industrial strength Velcro on the battery compartment lid and on the vehicle. However in high stress situations such as road or stage rallies this is not recommended.

Stopwatches

Q: When I switch the unit on and look through the different modes, why do the stopwatch times appear to be random and at unexpected values?
A: The stopwatches continue to count time when the unit is switched off, or there is a supply interruption and there are no batteries fitted. So if you switch the unit off with any stopwatches running (or paused, where the stopwatch continues to count time in the background) then the stopwatches will show their accurate value at power on. This may appear to be a random value, depending how long the unit has been switched off for, but it will be the correct value.

Distance Displays

Q: Why are the distance displays in Rally and Regularity Mode not changing as the vehicle moves, but the trip distance changes in Stage Mode?
A: The remote unit rocker switch is probably set to Paused, which is affecting the Rally and Regularity Modes, but not Stage Mode - as there is no reason to pause the distance display on

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a special stage. You will also see that there is a solid dot at the end of the Rally and Regularity distance displays which indicate that the displays are paused.

Q: Why don't the buttons on the front panel change the direction of the distance displays when a remote unit is fitted?
A: The unit detects that the remote unit is present and stops the front panel buttons changing the distance direction - the remote unit takes precedence. It would be too confusing if, for example, the remote unit rocker switch was set to Forward but the displays were able to be set in reverse from the front panel buttons.

Q: Does the ability to enter the Calibration Distance or the Distance Adjustment distance to 3 decimal places affect the unit's eligibility for events not allowing/penalising the use of 3 decimal place tripmeters?
*A: No. The unit does not display distances to 3 decimal places when showing trip distances – the setting of Calibration Distance or the Distance Adjustment distance to 3 decimal places just allows accurate calibration of the unit. As of June 2013, HERO has specifically indicated that **RoamerTime+** units **do not** attract the timing penalty applicable to tripmeters displaying distance to 3 decimal places.*

Q: What should I do if the Time of Day is not being retained when the unit is switched off?
A: Contact The Basic Roamer Company. In the interim, you can set the Time of Day when the unit is turned on and it will remain accurate while the unit is powered up.

Speed Mode

Q: Does the ability to display current speed affect the unit's eligibility for events not allowing/penalising the use of tripmeters showing average speed?
*A: No. **RoamerTime+** units do not calculate or display average speed under any circumstances. As of June 2013, HERO has specifically indicated that **RoamerTime+** units do not attract the timing penalty applicable to tripmeters displaying average speed.*

Connections

Q: Can I have two distance sensors connected to the unit at the same time, for example, a wheel bolt sensor and a feed from an electronic speedo or a speedo cable sensor?
A: Yes, but the distance displays will "double count". If you want to do this, you will need an external switch that ensures only one sensor is sending pulses to the unit at any one time. Also note that different sensor types (e.g. a wheel bolt sensor vs. an electronic speedo connection) will usually require a different calibration value.

Software Version

Q: What's changed in software version 1.52.x compared with software version 1.50.x?
1 .New licenced speed mode – current speed, time of day and trip distance displayed
2. User choice whether distance displays show 1 or 2 decimal places.

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RoamerTime+

BASIC MODE
ROAD MODE
RALLY MODE
REGULARITY MODE
STAGE MODE
TOTALS MODE

It's a Navigator's Thing